TAXONOMIC COLLECTIONS OF VASCULAR PLANTS IN THE SOUTHEASTERN STATES—THEIR ABUNDANCE AND RELATION TO PRODUCTION OF FLORAS

Wilbur H. Duncan

In planning for extensive collecting in the Southeastern States during 1953, much attention was given to the matter of where collections should be made. The location of poorly collected areas was thought to be of considerable importance. Published records of distribution were examined for several species but no definite over-all pattern was discernible. Finally a composite map of dots was prepared to indicate citations by county of specimens from the Southeastern States, including Arkansas and Louisiana, in taxonomic papers covering 62 species in five genera. The genera were *Ruellia* (Fernald, 1945), *Selaginella* (Clausen, 1946) *Liatris* (Gaiser, 1946), *Tephrosia* (Wood, 1949), and *Sabatia* (Wilbur, 1952). Distribution data for *Sabatia* were provided by Dr. Robert L. Wilbur from his unpublished manuscript and are gratefully acknowledged.

Only one dot was placed in a given county for a given species. Several collections of one species from each of such counties as Dade, Duval, and Hillsborough in Florida are represented, therefore, by one dot in each county.

Graphic analysis of the final dot map (Figure 1) indicates clearly a number of relatively poorly collected areas [e.g.; (1) most of Mississippi, Louisiana, and Tennessee; (2) large areas in Arkansas, Alabama, Georgia, and South Carolina; and (3) smaller areas in North Carolina]. Florida appears relatively well collected throughout.

One should keep in mind that the five genera are largely southeastern in distribution and that the number of dots in a given area probably should not be compared absolutely with that of certain other distant areas, e.g., western Tennessee and northern Florida.

In making an analysis of the dot map, one should also take due consideration of recent intensive collecting in certain areas, (e.g., A. J. Sharp and R. E. Shanks in Tennessee; William Fox, R. K. Godfrey, and others in North Carolina; Robert Thorne and

myself in Georgia). These collections were partly available or not at all to Gaiser, Fernald, Clausen, and Wood.

A number of counties with relative large collections, however, are adjacent to counties, or larger areas, with little or no recorded collections. Examples of such counties are Rapides and Natch-

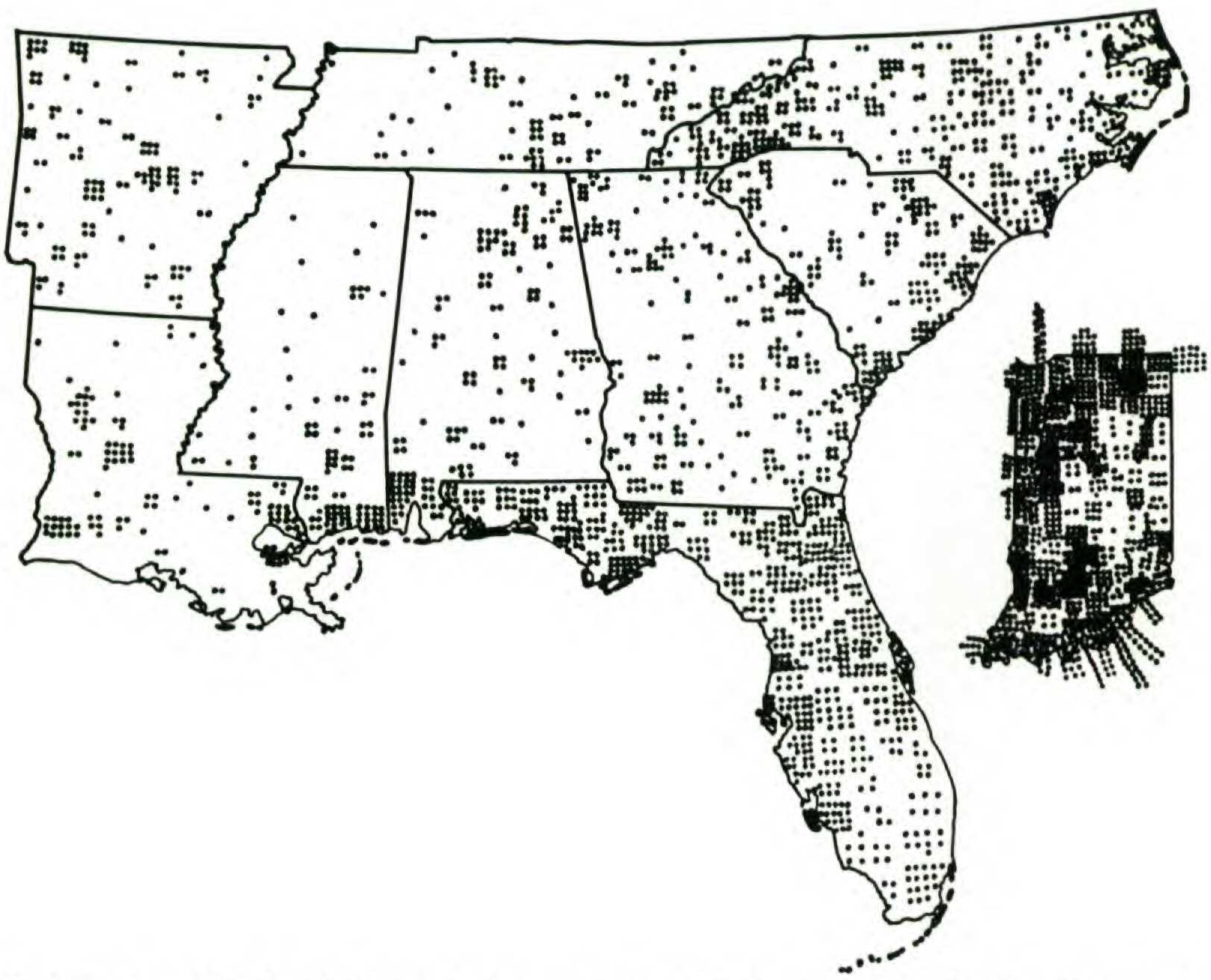

Figure 1. Map of nine southeastern states and Indiana showing by dots the number of species (out of 62) reported for each county.

itoches in Louisiana, Cullman and Lee in Alabama, Richmond and Floyd in Georgia, Davison and Knox in Tennessee, and Darlington and Anderson in South Carolina. Such concentrations are frequently correlated with locations of educational insititutions and/or with localities where one or a few persons made concentrated collections. Analyses of such relationships would undoubtedly be interesting, but they are not, however, within the scope of this paper. The abrupt shifts in numbers of collections recorded from given counties to adjacent counties in my opinion usually reflect existing differences in the amount of collecting of all species of vascular plants.

Graphic analysis of the data (Figure 1) readily demonstrates that Florida is the best collected state. The relative standing of the other states is not so clearly evident. The dots for each state, therefore, were totaled and the average number per county calculated. It is assumed that if all other factors were equal, the smaller the county the fewer the number of species collected in it. To compensate for this an "area factor" was computed by dividing the average area of the counties for each state into the average area of the counties in Florida whose counties had the greatest average area. This "area factor" for each state was then multiplied by the average number of collections per county for that state to give the "corrected average number of collections" per county which we shall use in establishing the position for each state. The data are presented in Table 1, Florida presenting the best record and Mississippi the lowest. The differences between the "corrected average number of collections" for Florida and each of the other states are probably significant. The difference between the values for Mississippi and Louisiana, for example, probably is not.

At this point in my analysis of the data a question that has frequently come to my mind, and undoubtedly to other taxonomists, again became prominent. Are there sufficient numbers of specimens upon which to base work on good modern floras of the various states or even of the whole Southeastern States? One way to analyze this question is to compare the present data for the Southeastern States with similar data from some area having a good flora. It is conceded by many that Deam's (1940) Flora of Indiana is probably the best state flora produced. The five genera included in the present analysis are not, however, well represented in Indiana, and could not, therefore, be used in making the comparison desired between Indiana and the Southeastern States. It was decided to select 62 species from Deam's "Flora" and make a comparison with them.

The "Flora" was opened near the middle and the first large genus that was encountered, *Desmodium*, was chosen. Certain other genera that followed were also included. No attention was paid to the maps until after a total of 62 species was listed for compilation. The final list included all species in *Desmodium* (16), *Lespedeza* (11), *Lathyrus* (4), *Apios* (1), *Oxalis* (6), *Polygala*

TABLE I

Average Number of Collections per County Cited in Monographs of 5 Genera, Including 62 Species, for Each of 9 States, Data for Indiana Being Based on Another 62 Species. The Area Factor, a Value Compensating for Relative Average Size of Counties; Corrected Average Number of Collections; and Total Number of Species Reported Are Also Given.

State	No. of Counties	Average Number Collections per Co.	Area Factor	Corrected Average Number Collections	Total Number Species Reported
Florida	67	9.3	1.00	9.3	41
N. Carolina	100	3.5	1.66	5.8	30
S. Carolina	46	3.5	1.30	4.6	32
Georgia	159	1.6	2.36	3.8	41
Alabama	67	2.3	1.14	2.6	35
Arkansas	75	1.7	1.23	2.1	16
Louisiana	64	1.7	1.15	2.0	31
Tennessee	95	1.0	1.97	2.0	17
Mississippi	82	1.1	1.50	1.7	23
Indiana	92	12.6	1.22	28.0	62

(8), and *Euphorbia* (16). A composite map for Indiana was prepared for the 62 species (Figure 1). Dots were so abundant in many counties that it was necessary to place dots adjacent to the counties and outside of the state boundaries. It appears that the average number of specimens per species upon which Deam's Flora was based much exceeds that of any Southeastern State. The "corrected average number of collections" per county for Indiana is 28.0 over 3 times that for Florida, 7 times that for Georgia, and 16 times that for Mississippi.

In comparing the amount of material from Indiana with that from any southeastern state, the number of species (out of the 62) that might be expected to occur in each state should be considered. This number is undoubtedly greater in every instance than the number of species reported per state (Table 1). Even assuming that no more than 16 species will be reported for Arkansas, which is the state with lowest number, a comparison of the ratios of 16/2.1 for Arkansas and 62/28 for Indiana indicates that there are only one/third as many specimens available for study in Arkansas as compared to Indiana.

These and other data have convinced me that more collecting must be done in most parts of the Southeast before new Floras of the area should be attempted. Perhaps others will have a different opinion. There probably is little doubt, however, that many areas in the Southeast are very poorly represented by collections. It is urged, therefore, that monographers and others studying plant material of species whose ranges include the Southeast be prudent by obtaining for study the maximum number of specimens from this area. Adequate specimens from this area are not now available in the major herbaria of the United States. Recent intensive collections, now included in herbaria at several of the southeastern educational institutions, may provide a good beginning towards eliminating the problem of too few specimens for study. The effect of these recent collections on the dot map is evident to me in the composite map not shown for the species of *Sabatia*. A majority of the dots (Figure 1) in Southwestern Georgia represent collections of *Sabatia* by Robert Thorne. Thorne's collections from Southwestern Georgia are absent or mostly so from the other species included in the map. No matter how few specimens a given

institution in the southeast may be able to provide in response to a request for a loan, it is a duty to send them for study upon request, if for no other reason than the fact that one specimen from this area means much more, perhaps 5 to 15 times as much, as would a specimen, e.g. from Indiana, New York, or Massachusetts.—DEPARTMENT OF BOTANY, UNIVERSITY OF GEORGIA, ATHENS, GEORGIA.

Literature Cited

Clausen, Robert T. 1946. *Selaginella*, subgenus Euselaginella, in the Southeastern United States. Amer. Fern Journal **36:** 65–82.

Deam, C. C. 1940. Flora of Indiana 1236 p. Indiana Department of Conservation.

Fernald, M. L. 1945. *Ruellia* in the Eastern United States. Rhodora **47:** 1–38, 47–63, 69–90.

Gaiser, L. O. 1946. The genus *Liatris*. Rhodora **48:** 165–183, 216–263, 273–326, 331–382, 393–412.

Wilbur, Robert L. 1952. A revision of the North American genus *Sabatia* (Gentianaceae) 287 p. unpublished thesis, University of Michigan.

Wood, Carroll E., Jr. 1949. The American barbistyled species of *Tephrosia* (Leguminosae) Rhodora **51:** 193–231, 233–302, 305–364, 370–384.

Nomenclature of American Mountain-ash.—There are two species of native mountain-ash occurring spontaneously in eastern United States. The one with acuminate leaflets and small fruits was first described from Pennsylvania by Marshall in 1785 as *Sorbus americana*. The other species, with acute leaflets and larger fruits, was first described as *S. aucuparia* var. β by Michaux in 1803. Pursh in 1814 treated it as a species, also named *S. americana*. This was transferred to Pyrus, as *P. americana*, by De Candolle in 1825. In 1902 it was treated by Sargent as *P. americana* var. *decora*, and in 1906 was raised to specific rank as *Sorbus decora* (Sarg.) Schneider. Although it has been clearly pointed out[1] that *Pyrus americana* DC. does not refer to the same species as *Sorbus americana* Marsh., yet followers of "Gray's Manual of Botany" continue to refer to the American Mountain-ash as *Pyrus americana* (Marsh.) DC.

It is not the purpose in this short article to urge the retention of Sorbus for the mountain-ashes, Pyrus for pears, or Malus for apples (see L. H. Bailey in Gentes Herbarum **8:** 40–43, 1949), because the basic morphological facts (see Decaisne in Nouv.

[1] Journ. Arnold Arb. **20:** 11–16 (1939).